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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,471	04/21/2004	Makoto Shiomi	12480-000046/US	5349

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EXAMINER	
PERVAN, MICHAEL	

ART UNIT	PAPER NUMBER
2629	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/828,471	SHIOMI, MAKOTO	
	Examiner	Art Unit	
	Michael Pervan	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 June 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed June 4, 2009 have been fully considered but they are not persuasive.

Applicant (on page 11 of argument) argues that Cavanaugh does not disclose the heater including a plurality of heater electrodes, each of the plurality of heater electrodes being formed as a linear band aligned to be parallel with a side of the liquid crystal panel. Examiner respectfully disagrees.

The cells of a liquid crystal panel are typically aligned to form a linear band and are also parallel with a side of the liquid crystal panel. By using the temperature sensor/heater, incorporated into a cell of a liquid crystal, of Cavanaugh, the heater electrodes would then form a linear band which would be in parallel with a side of the liquid crystal panel.

Applicant (on page 12 of argument) resubmits the argument that Ham does not disclose the limitation of claims 3, 9 and 15.

Examiner continues to rely on the response from the Office Action dated July 11, 2008.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-2, 4-8, 10-14 and 16-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyata et al (US 2002/0033789; as submitted by applicant) in view of Davis et al (US 5,027,111) in view of Gaalema et al (US 5,694,147) in further view of Cavanaugh et al (US 6,943,768).

In regards to claim 1, Miyata discloses liquid crystal display, comprising: a memory storing (frame memory), until a next time, current data indicating current brightness (tone data) of each pixel provided in a liquid crystal panel (paragraph 77);

a look-up table precedently storing (i) combinations of previous data (preceding frame tone data) and the current data (display frame tone data) (paragraph 82), the combinations having possibilities to be inputted (paragraph 82), and (ii) output signals (a constant) corresponding to the respective combinations (paragraph 82);

control means for outputting an output signal as corrected current data in order to facilitate grayscale transition from a previous time to a current time (paragraph 72), by reading out, from the look-up table, data corresponding to a combination of previous data read out from the memory and current data (paragraph 73), and outputting that data or that data after being interpolated, instead of the current data (paragraph 73; since the controller is outputting the data from the LUT as is).

Miyata does not disclose a heater heating the liquid crystal panel and heater control means for controlling start and stop of heating by the heater, in such a manner as to keep a sensed temperature of the liquid crystal panel to be not more than +/- 3^{o} C

of a predetermined target temperature which is within a range between 33° C and 63° C.

Davis discloses a heater heating the liquid crystal panel (col. 5, lines 1-16) and heater control means for controlling start and stop of heating by the heater, in such a manner as to keep a sensed temperature of the liquid crystal panel to be within a range between 33° C and 63° C (col. 5, lines 38-41).

It would have been obvious at the time of invention to modify Miyata with the teachings of Davis, keeping a LCD in an operational temperature range, because it assures that the LCD will always be operational without regard to the surrounding temperature.

Miyata and Davis do not disclose a temperature of LCD panel not more than +/- 3° C of a predetermined target temperature.

Gaalema discloses a temperature of LCD panel not more than +/- 3° C of a predetermined target temperature (col. 5, line 55-col. 6, line 30).

It would have been obvious at the time of invention to modify Miyata and Davis with the teachings of Gaalema, keeping a LCD in at an operational temperature, because it assures that the LCD will always be operational without regard to the surrounding temperature.

Miyata, Davis and Gaalema do not disclose the sensed temperature of the liquid crystal panel being determined by sensing a temperature of a plurality of separate sections of the liquid crystal panel.

Cavanaugh discloses the sensed temperature of the liquid crystal panel being determined by sensing a temperature of a plurality of separate sections of the liquid crystal panel and the heater including a plurality of heater electrodes, each of the plurality of heater electrodes being formed as a linear band aligned to be parallel with a side of the liquid crystal panel (col. 9, lines 26-32 and 49-67).

It would have been obvious at the time of invention to modify Miyata, Davis and Gaalema with the teachings of Cavanaugh, liquid crystal cell with temperature sensor and heating element, because it would allow the cell to be kept at a constant temperature (col. 5, lines 7-12).

In regards to claims 2, 8 and 14, Miyata discloses the liquid crystal display as defined in claim 1, wherein, a number of the look-up table is one (Fig. 1; as can be seen from the drawing, there is only one LUT).

In regards to claims 4, 10 and 18, Miyata does not disclose the liquid crystal display as defined in claim 1, wherein, the target temperature is determined to be within a range between 48^{o} C and 63^{o} C.

Davis discloses the liquid crystal display as defined in claim 1, wherein, the target temperature is determined to be within a range between 48^{o} C and 63^{o} C (col. 5, lines 38-41).

It would have been obvious at the time of invention to modify Miyata with the teachings of Davis, keeping a LCD in an operational temperature range, because it

assures that the LCD will always be operational without regard to the surrounding temperature.

In regards to claims 5, 11 and 19, Miyata does not disclose the liquid crystal display as defined in claim 2, wherein, the target temperature is determined to be within a range between 48° C and 63° C.

Davis discloses the liquid crystal display as defined in claim 2, wherein, the target temperature is determined to be within a range between 48° C and 63° C (col. 5, lines 38-41).

It would have been obvious at the time of invention to modify Miyata with the teachings of Davis, keeping a LCD in an operational temperature range, because it assures that the LCD will always be operational without regard to the surrounding temperature.

In regards to claims 6, 12 and 22, Miyata does not disclose the liquid crystal display as defined in claim 1, wherein, the liquid crystal panel includes a liquid crystal cell in vertical align mode and is driven in normally black mode.

However, Miyata does disclose having an LCD (paragraph 71).

Since there is no benefit or advantage cited in the specification for having the LCD in vertical align, normally black mode, it would have been obvious to one of ordinary skill in the art to have the LCD be in a vertical align, normally black mode based on a designer's choice.

In regards to claim 7, Miyata discloses a liquid crystal display, comprising: a memory storing (frame memory), until a next time, current data indicating current brightness (tone data) of each pixel provided in a liquid crystal panel (paragraph 77);

a look-up table precedently storing (i) combinations of previous data (preceding frame tone data) and the current data (display frame tone data) (paragraph 82), the combinations having possibilities to be inputted (paragraph 82), and (ii) output signals (a constant) corresponding to the respective combinations (paragraph 82);

control means for outputting an output signal as corrected current data in order to facilitate grayscale transition from a previous time to a current time (paragraph 72), by reading out, from the look-up table, data corresponding to a combination of previous data read out from the memory and current data (paragraph 73), and outputting that data or that data after being interpolated, instead of the current data (paragraph 73; since the controller is outputting the data from the LUT as is).

Miyata does not disclose a heater heating the liquid crystal panel and heater control means for controlling the heater so as to either stop the heating by the heater when a sensed temperature of the liquid crystal panel exceeds a threshold value which is 1^{o} C through 1.5^{o} C higher than a target temperature, or start the heating by the heater when the sensed temperature of the liquid crystal panel goes below a threshold value which is 1^{o} C through 1.5^{o} C lower than the target temperature, the target temperature being determined in advance to be in a range between 33^{o} C and 63^{o} C.

Davis discloses a heater heating the liquid crystal panel (col. 5, lines 1-16) and heater control means for controlling the heater so as to either stop the heating by the heater when a sensed temperature of the liquid crystal panel exceeds a range between 33° C and 63° C (col. 5, lines 1-16, 38-41; since the heater control means is maintaining the temperature in an operational range it will turn on when the temperature is too low and turn off when it is too high).

It would have been obvious at the time of invention to modify Miyata with the teachings of Davis, keeping a LCD in an operational temperature range, because it assures that the LCD will always be operational without regard to the surrounding temperature.

Miyata and Davis do not disclose a threshold value which is 1° C through 1.5° C higher than a target temperature, or start the heating by the heater when the sensed temperature of the liquid crystal panel goes below a threshold value which is 1° C through 1.5° C lower than the target temperature.

Gaalema discloses a threshold value which is 1° C through 1.5° C higher than a target temperature, or start the heating by the heater when the sensed temperature of the liquid crystal panel goes below a threshold value which is 1° C through 1.5° C lower than the target temperature (col. 5, lines 38-41).

It would have been obvious at the time of invention to modify Miyata and Davis with the teachings of Gaalema, keeping a LCD in at an operational temperature, because it assures that the LCD will always be operational without regard to the surrounding temperature.

Miyata, Davis and Gaalema do not disclose the sensed temperature of the liquid crystal panel being determined by sensing a temperature of a plurality of separate sections of the liquid crystal panel.

Cavanaugh discloses the sensed temperature of the liquid crystal panel being determined by sensing a temperature of a plurality of separate sections of the liquid crystal panel and the heater including a plurality of heater electrodes, each of the plurality of heater electrodes being formed as a linear band aligned to be parallel with a side of the liquid crystal panel (col. 9, lines 26-32 and 49-67).

It would have been obvious at the time of invention to modify Miyata, Davis and Gaalema with the teachings of Cavanaugh, liquid crystal cell with temperature sensor and heating element, because it would allow the cell to be kept at a constant temperature (col. 5, lines 7-12).

In regards to claim 13, Miyata discloses liquid crystal display, comprising: a memory storing (frame memory), until a next time, current data indicating current brightness (tone data) of each pixel provided in a liquid crystal panel (paragraph 77);

a look-up table precedently storing (i) combinations of previous data (preceding frame tone data) and the current data (display frame tone data) (paragraph 82), the combinations having possibilities to be inputted (paragraph 82), and (ii) output signals (a constant) corresponding to the respective combinations (paragraph 82);

control means for outputting an output signal as corrected current data in order to facilitate grayscale transition from a previous time to a current time (paragraph 72), by

reading out, from the look-up table, data corresponding to a combination of previous data read out from the memory and current data (paragraph 73), and outputting that data or that data after being interpolated, instead of the current data (paragraph 73; since the controller is outputting the data from the LUT as is).

Miyata does not disclose a heater heating the liquid crystal panel and heater control means for controlling start and stop of heating by the heater, in such a manner as to keep a difference between a sensed temperature of the liquid crystal panel and a target temperature to be not more than a predetermined threshold value, the target temperature being a temperature at which, by facilitating the grayscale transition by the control means, each pixel is virtually able to reach a desired grayscale level in every grayscale level transition, the threshold value being set in such a manner as to keep a difference between a grayscale level at which a pixel reaches as a result of the grayscale level correction by the control means and a target grayscale level to be within an allowable range.

Davis discloses a heater heating the liquid crystal panel (col. 5, lines 1-16) and heater control means for controlling start and stop of heating by the heater, in such a manner as to keep a difference between a sensed temperature of the liquid crystal panel and a target temperature to be not more than a predetermined threshold value, the target temperature being a temperature at which, by facilitating the grayscale transition by the control means, each pixel is virtually able to reach a desired grayscale level in every grayscale level transition, the threshold value being set in such a manner as to keep a difference between a grayscale level at which a pixel reaches as a result

of the grayscale level correction by the control means and a target grayscale level to be within an allowable range (col. 5, lines 1-16, 38-41; since the heater control means is maintaining the temperature in an operational range it will turn on when the temperature is too low and turn off when it is too high).

It would have been obvious at the time of invention to modify Miyata with the teachings of Davis, keeping a LCD in an operational temperature range, because it assures that the LCD will always be operational without regard to the surrounding temperature.

Miyata and Davis do not disclose a target temperature.

Gaalema discloses a target temperature (col. 5, lines 38-41).

It would have been obvious at the time of invention to modify Miyata and Davis with the teachings of Gaalema, keeping a LCD in at an operational temperature, because it assures that the LCD will always be operational without regard to the surrounding temperature.

Miyata, Davis and Gaalema do not disclose the sensed temperature of the liquid crystal panel being determined by sensing a temperature of a plurality of separate sections of the liquid crystal panel.

Cavanaugh discloses the sensed temperature of the liquid crystal panel being determined by sensing a temperature of a plurality of separate sections of the liquid crystal panel and the heater including a plurality of heater electrodes, each of the plurality of heater electrodes being formed as a linear band aligned to be parallel with a side of the liquid crystal panel (col. 9, lines 26-32 and 49-67).

It would have been obvious at the time of invention to modify Miyata, Davis and Gaalema with the teachings of Cavanaugh, liquid crystal cell with temperature sensor and heating element, because it would allow the cell to be kept at a constant temperature (col. 5, lines 7-12).

In regards to claim 16, Miyata does not disclose the liquid crystal display as defined in claim 13, wherein, the target temperature is determined to be within a range between 33° C and 63° C.

Davis discloses the liquid crystal display as defined in claim 13, wherein, the target temperature is determined to be within a range between 33° C and 63° C (col. 5, lines 38-41).

It would have been obvious at the time of invention to modify Miyata with the teachings of Davis, keeping a LCD in an operational temperature range, because it assures that the LCD will always be operational without regard to the surrounding temperature.

In regards to claim 17, Miyata does not disclose the liquid crystal display as defined in claim 14, wherein, the target temperature is determined to be within a range between 33° C and 63° C.

Davis discloses the liquid crystal display as defined in claim 14, wherein, the target temperature is determined to be within a range between 33° C and 63° C (col. 5, lines 38-41).

It would have been obvious at the time of invention to modify Miyata with the teachings of Davis, keeping a LCD in an operational temperature range, because it assures that the LCD will always be operational without regard to the surrounding temperature.

In regards to claim 20, Miyata does not disclose the liquid crystal display as defined in claim 13, wherein, the allowable range is such a range that an error between a target brightness and a brightness obtained as a result of the grayscale transition to the current time is not more than +/- 20%.

Davis discloses the liquid crystal display as defined in claim 13, wherein, the allowable range is such a range that an error between a target brightness and a brightness obtained as a result of the grayscale transition to the current time is not more than +/- 20% (col. 5, lines 1-16, 38-41; by keeping the LCD in an operational range the target brightness and obtained brightness would be well within +/- 20%).

It would have been obvious at the time of invention to modify Miyata with the teachings of Davis, keeping a LCD in an operational temperature range, because it assures that the LCD will always be operational without regard to the surrounding temperature.

In regards to claim 21, Miyata does not disclose the liquid crystal display as defined in claim 14, wherein, the allowable range is such a range that an error between

a target brightness and a brightness obtained as a result of the grayscale transition to the current time is not more than +/- 20%.

Davis discloses the liquid crystal display as defined in claim 14, wherein, the allowable range is such a range that an error between a target brightness and a brightness obtained as a result of the grayscale transition to the current time is not more than +/- 20% (col. 5, lines 1-16, 38-41; by keeping the LCD in an operational range the target brightness and obtained brightness would be well within +/- 20%).

It would have been obvious at the time of invention to modify Miyata with the teachings of Davis, keeping a LCD in an operational temperature range, because it assures that the LCD will always be operational without regard to the surrounding temperature.

In regards to claim 23, Miyata does not disclose the liquid crystal display as defined in claim 1, wherein, the heater control means controls start and stop of heating by the heater irrespective of ambient temperature.

Davis discloses In regards to claim 23, Miyata does not disclose the liquid crystal display as defined in claim 1, wherein, the heater control means controls start and stop of heating by the heater irrespective of ambient temperature (col. 5, lines 1-12).

It would have been obvious at the time of invention to modify Miyata with the teachings of Davis, keeping a LCD in an operational temperature range, because it assures that the LCD will always be operational without regard to the surrounding temperature.

In regards to claim 24, Miyata, Davis and Gaalema do not disclose the liquid crystal display as defined in claim 1, wherein the heater control means comprises:

a plurality of temperature sensors, each of the plurality of temperature sensors being configured to sense the temperature of a separate section of the liquid crystal panel.

Cavanaugh discloses wherein the heater control means comprises:

a plurality of temperature sensors, each of the plurality of temperature sensors being configured to sense the temperature of a separate section of the liquid crystal panel (col. 9, lines 26-32 and 49-67).

It would have been obvious at the time of invention to modify Miyata, Davis and Gaalema with the teachings of Cavanaugh, liquid crystal cell with temperature sensor and heating element, because it would allow the cell to be kept at a constant temperature (col. 5, lines 7-12).

4. Claims 3, 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyata et al in view of Davis et al in view of Gaalema et al in view of Cavanaugh et al in further view of Ham (US 7,106,287).

In regards to claims 3, 9 and 15, Miyata, Davis, Gaalema and Cavanaugh do not disclose the liquid crystal display as defined in claim 1, wherein, the look-up table is arranged so as to correspond to the target temperature.

Ham discloses the liquid crystal display as defined in claim 1, wherein, the look-up table is arranged so as to correspond to the target temperature (col. 6, lines 44-54).

It would have been obvious at the time of invention to modify Miyata, Davis, Gaalema and Cavanaugh with the teachings of Ham, multiple LUTs according to temperature, because it gives the LCD a better picture quality since the pixels will be driven at proper voltages according to the current temperature.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Pervan whose telephone number is (571) 272-0910. The examiner can normally be reached on Monday - Friday between 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000

MVP

/Amr Awad/
Supervisory Patent Examiner, Art Unit 2629

Sept. 1, 2009